

of 5000 to 5500 lb. per square inch is allowed at the bottom of the thread, and a stress from 3000 to 3500 lb. per square inch in the body. At the crosshead end the attachment usually consists of a parallel part secured by a cotter, with the end of the rod butting against the bottom of the hole in the crosshead. Some makers adopt a cone of i in 3, as in the case of the piston end, but the end of the rod is the real driving part, the cone serving the purpose mentioned before.

The tensile stress on the section through the cotter hole should not exceed 5000 lb. per square inch, and this to a large extent fixes the diameter of the rod in the body. The cotter may have a thickness equal to not more than one-fourth the diameter of the rod, and a depth equal to the diameter, or even 1*2 times the diameter. The cotter is in double shear, and the stress may be 5000 to 5500 lb. per square inch. The bending stress on the

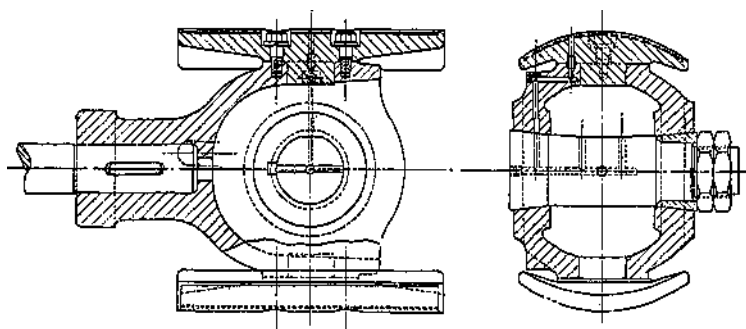


Fig. 12.—Design of Robey Crosshead

cotter should be checked, and, assuming a distributed load, the bending moment is $Pd/8$, where P lb. is the piston load and d in. is the diameter of the rod. The stress is in one direction, and should be about 8000 lb. per square inch. The stresses in the piston-rod, &c., are taken on the basis of the maximum effective load on the piston, due to the difference in pressure on the two sides. The cotter may have a taper of $\frac{1}{4}$ in. per foot, or about i in 40.

Some makers give the piston-rods an initial camber in a hydraulic press, just sufficient to overcome the weight of the piston.

Crossheads.—There are many varieties of this

member. Bored guides are almost universal, and the slippers are of simple design usually of cast iron, but cast steel is sometimes used. The methods of attaching the piston-rod, and the designs of connecting-rod end, vary greatly, and these practically decide the type of crosshead. A good and reliable design is similar to that adopted in marine practice, where a forked connecting-rod end is used, with fixed gudgeons on the crosshead, and the piston-rod is fixed to the body by a nut and cone. The body consists of a cubical block of steel, to which the slippers are attached. A design used by Messrs. Robey & Co. is shown in fig. 12. This is for a solid-ended rod. The pin is fixed by a taper at one end, and a tapered split collar at the other,